



**SWEEP
SWEEP**
SOIL AND WATER
ENVIRONMENTAL
ENHANCEMENT PROGRAM



**PAMPA
PAMPA**
PROGRAMME D'AMÉLIORATION
DU MILIEU PÉDOLOGIQUE
ET AQUATIQUE



SWEEP

is a \$30 million federal-provincial agreement, announced May 8, 1986, designed to improve soil and water quality in southwestern Ontario over the next five years.

PURPOSES

There are two interrelated purposes to the program; first, to reduce phosphorus loadings in the Lake Erie basin from cropland run-off; and second, to improve the productivity of southwestern Ontario agriculture by reducing or arresting soil erosion that contributes to water pollution.

BACKGROUND

The Canada-U.S. Great Lakes Water Quality Agreement called for phosphorus reductions in the Lake Erie basin of 2000 tonnes per year. SWEEP is part of the Canadian agreement, calling for reductions of 300 tonnes per year — 200 from croplands and 100 from industrial and municipal sources.



PAMPA

est une entente fédérale-provinciale de 30 millions de dollars, annoncée le 8 mai 1986, et destinée à améliorer la qualité du sol et de l'eau dans le Sud-ouest de l'Ontario.

SES BUTS

Les deux buts de PAMPA sont: en premier lieu de réduire de 200 tonnes par an d'ici 1990 le déversement dans le lac Erie de phosphore provenant des terres agricoles, et de maintenir ou d'accroître la productivité agricole du Sud-ouest de l'Ontario, en réduisant ou en empêchant l'érosion et la dégradation du sol.

SES GRANDES LIGNES

L'entente entre le Canada et les États-Unis sur la qualité de l'eau des Grands Lacs prévoyait de réduire de 2 000 tonnes par an la pollution due au phosphore dans le bassin du lac Erie. PAMPA fait partie de cette entente qui réduira cette pollution de 300 tonnes par an — 200 tonnes provenant des terres agricoles et 100 tonnes provenant de sources industrielles et municipales.

1987/88 REVIEW
OF THE
SOIL AND WATER ENHANCEMENT PROGRAM (SWEEP)

A CRITIQUE OF THE
SWEEP EVALUATION FRAMEWORK

Prepared for: The SWEEP Management Committee
by: The SWEEP Evaluation Committee

July 18, 1988

TABLE OF CONTENTS

	<u>Page</u>
Introduction	1
Procedure	2
Results	3
Subprogram 1 - Conservation Resource Centre	4
Subprogram 1 - Socioeconomic Evaluation	5
Subprogram 1 - Technology Assessment Panel	5
Subprogram 2 - Farm Level Economic Analysis	5
Subprogram 2 - Technology Evaluation and Development	6
Subprogram 3 - Pilot Demonstration Watersheds	8
Subprogram 4 - Local Demonstrations	8
Subprogram 5 - Technical Assistance	9
Subprogram 6 - Soil Conservation Incentives	10
Subprogram 7 - Administration, Monitoring and Public Information	10
Environmental Monitoring and Modelling Committee	11
General Comments	12
Recommendations	13
Appendix 1: SWEEP Evaluation Framework	

1987/88 ANNUAL REVIEW OF THE SOIL AND WATER ENVIRONMENTAL ENHANCEMENT PROGRAM

INTRODUCTION

This is the first annual review of the Soil and Water Environmental Enhancement Program (SWEEP) prepared by the Evaluation Committee for the SWEEP Management Committee and covers the fiscal year 1987/88. Little space is devoted to describing the particulars of the SWEEP Program itself, the Management Committee being well versed in the program. The report therefore concentrates on the review process itself, its focus being to ensure that an effective evaluation can take place at the end of the program. The review process will also provide information to the Management Committee on any significant deviations or developments which could affect the achievement of the overall goals of SWEEP. The review procedures and their rationales are described in the report.

For the purpose of program management, the following review and discussion is organized on a subprogram basis rather than on evaluation issues.

PROCEDURE

The first stage in the review was to examine all existing reports and material. The Quarterly Reports for the first three quarters of the fiscal year 1987/88 were the main source of facts. These were reviewed with the intent of gleaning information useful in addressing the evaluation issues as stated in the SWEEP Evaluation Framework. Note was taken of whether the Quarterly Reports would be useful sources of information in future reviews of the program.

Several other sources of information used were subprogram files, Implementation Plans, financial reports and minutes of committee meetings. Once all in-house data was collected, it was reviewed and tentative conclusions drawn which later altered the direction of the review.

At this point the subprogram managers were contacted by letter. They were given a copy of the evaluation issues to be addressed by data from their subprogram as well as the data collected to date. Follow-up telephone calls were made arranging meetings if necessary. The purpose of the meetings was to review the information found to date and the evaluation issues assigned to each subprogram.

The meeting was an opportunity for the subprogram managers to verify the facts assembled and to give assistance in finding missing data. Minor changes were made in the wording of some questions to take into account the methods of collecting various information. The ability to address the pertinent evaluation issues in future was discussed in order to determine whether an evaluation at the end of the program would be possible.

RESULTS

The evaluation of the Soil Water Environmental Enhancement Program was originally intended to be carried out using the evaluation issues in the SWEEP Evaluation Framework. SWEEP would be evaluated as a whole as to whether or not it was meeting its goals. However, it became apparent that this approach would not be feasible for this year's review. The Evaluation Framework was approved December 2, 1987. Therefore, the subprogram managers did not have sufficient time to put mechanisms in place to gather the data required from their subprograms. As well, much of the data to be collected was of such a nature that it would be collected in the spring, summer and fall and those seasons had already passed for 1987/88.

Delays in implementing the federal subprograms hampered the generation of data for the purposes of the review. Since most of federal programs were not ready to begin operation until 1988/89 no data was available. At this time next year the initial data for these subprograms will be on hand.

Since much of data was not yet available to address the evaluation issues attributed to SWEEP, the focus for this year's review was modified. Consequently this first review has been undertaken as a "status check" on the systems now in place to ensure an adequate and useful evaluation of SWEEP can be performed at the end of the program. The analysis in this review looked at current activities and data collection systems on a sub-program basis. These were compared to the data required for each evaluation issue, as identified in the evaluation framework (Appendix 1).

Subprogram One -- Conservation Resource Centre

The Conservation Resource Centre was on hold for the fiscal year 1987/88. Difficulties had occurred in finding an appropriate co-ordinating organization. As a result there was no data to be collected. There has been discussion with the University of Guelph as to its running the centre. A permanent institution such as the university would be able to continue with the centre after federal funding has been removed. One disadvantage is that the Conservation Resource Centre's mandate may be hidden by the other roles the university plays.

Program managers in SWEEP still feel that this aspect of subprogram one is important. Its strongest function would be to act as a link between research and extension -- one that people can readily identify. We believe this to be a crucial link. Without it the technology transfer process breaks down midway. As new research is generated there will be no good mechanism to communicate it to the farm level. Efforts to establish the centre should continue in order to fill this gap. The centre would provide a service to the farm community long after SWEEP is finished.

The medium - high priority data items for the conservation resource centre are:

- 1) Identification of the effects of reduced soil and phosphorus loadings in on-farm and off-farm activities (i.e. recreation, fishing, etc.)
- 2) Extent of private sector support for the CRC.

Subprogram One -- Socioeconomic Evaluation

The Socioeconomic Evaluation (SEE) component is currently funding studies covering topics such as motivation for adoption of conservation technologies; role of nongovernment organizations in management of agricultural soil degradation and water quality; Tillage 2000 and its effect on awareness of Conservation Tillage; economic assessment of the distribution of benefits arising from adopting conservation tillage; identification of barriers to the successful transfer of conservation technology; social structure and the choice of cropping technology; influence of personal networks on the decision to adopt conservation tillage. Not only will these studies increase interest in the academic setting, but as these studies are completed, hopefully the information generated can be put to use in answering the evaluation issues and used as a basis for designing future programs.

On closer examination one finds that the studies are predominantly being carried out by graduate students at the University of Guelph. One of the objectives of this subprogram was to increase research within the university community.

Initially other universities responded, but the proposals submitted in the last two years, except for one, have all been from the University of Guelph. This is understandable considering the nature of the topics, and the location of the Ontario Agricultural College in Guelph but this concentration on a single university should be examined.

The high priority data collection issues for the Socioeconomic Evaluation component of subprogram one are:

- 1) changes in economic indicators attributable to SWEEP (i.e. theoretical models)
- 2) changes in or development of new practices based on SWEEP activities.
- 3) numbers and values of new university research projects.

There is a strong possibility that this subprogram will be able to indicate changes in economic indicators, but whether or not they are attributable to SWEEP may be more difficult to discern.

The number of research projects funded under SEE can be enumerated in the future as well as the number of proposals, departments replying and so on.

It is probable that this program will be able to calculate the percent of farmers aware of soil and water quality issues. Four projects have already been funded in this area. There are on-going surveys that will provide some type of unscientific approach. SEE will provide valid observations over several years of the program.

Changes in, or development of new practices based on SWEEP activities, may be brought to light by the surveys. This is a high priority evaluation issue as it is trying to answer to what extent conservation practices would have been adopted in the absence of SWEEP.

The numbers and values of new university research projects may be more qualitative and indirect.

To know if there is new and useful information on the technology transfer process, the number of projects funded under the Socioeconomic Evaluation component specifically addressing technology transfer issues will be monitored, but not systematically.

Subprogram One -- Technology Assessment Panel

There are no specific evaluation issues assigned to the Technology Assessment Panel. However, since the review is analyzing the subprograms rather than the evaluation issues TAP is being included in this report. As stated in the Evaluation Assessment prepared by the DPA Group Inc., "The objective of the Technology Assessment Panel is to offer guidance to the Management Committee and subprogram managers by providing co-ordinated technical advice on research, development, and demonstration under SWEEP."

A review of the work completed by this group shows that it is carrying out the activities assigned to it. TAP has not delayed any of the other subprograms in their operations. Overall it seems to be functioning as intended and should be able to have the impacts and effects hoped for. The panel's existence is warranted and subprogram managers should be encouraged to utilize its resources.

Subprogram Two -- Farm Level Economic Analysis

The systems and reporting arrangements are in place to collect the data, but they are dependent on the work of the Technology, Evaluation and Development Subprogram and the Pilot Demonstration Watershed Subprogram. To date these subprograms have not

generated any data. The contractor has been ensuring that the TED and PDW contractors have and will be collecting identified relevant economic data. The information this component generates may only be for the last couple of years of the program, but the issues involved will be answered.

The high priority data collection needs for the Farm Level Economic Analysis are:

- 1) changes in farm costs (e.g. pesticide losses) under different technologies.
- 2) capital and/or start-up cost of conservation practices by technology.
- 3) change in operation costs, gross revenue and net income per hectare by technology.
- 4) change in macroeconomic indicators in SWEEP area (such as FCR, total output and farm net income).
- 5) percent of all farmers receiving assistance/information from SWEEP (specified by subprogram/component).

Systems will be in place by year end to collect the change in operation costs, gross revenue and net income per hectare by those technologies utilized in the PDW. There is a low probability of getting the information from TED.

It appears that the contractor will be able to collect changes in macroeconomic indicators in the SWEEP area such as FCR, total output and farm net income based on the PDW.

It will be very difficult under this component to measure the percent of all farmers receiving assistance/information from SWEEP (specified by subprogram/component). This is a high priority issue, but the evaluation issue it is directed to draws from several other areas for its answer.

Subprogram Two -- Technology Evaluation and Development

Five research contracts have been awarded and others have been signed for 1988/89. All capital items will be purchased in the next fiscal year. The Technology Assessment Panel reviewed the updated working plan. It is not possible to address the evaluation issues attached to this subprogram this year, but by next year the contracts will be up and running.

The high priority data collection items for the Technology Evaluation and Development subprogram are:

- 1) per hectare reduction in phosphorus runoff from test plots of new technologies.

- 2) changes in soil quality, erosion potential and management factors under new or improved technologies which impact on agricultural productivity.

Unfortunately, TED may not be able to supply very good numbers for the first item. The reason being that mostly small plot studies are being utilized. Thirty-seven Tillage-2000 sites with subsites based on slope position are being employed. The numbers(per ha reduction in P runoff) will come from environmental studies at the stream level rather than the field level. The University of Guelph is monitoring erosion/sediment transport. Indirectly this will indicate what the phosphorus runoff will be by using cesium 137 testing. The only other possibility of answering this question is work done by the Environmental Monitoring and Modelling Committee which is part of the Canada - Ontario agreement.

It will be possible to have opinions and observations on the rate of adoption of the best available technology and new technology. Some of the surveys being conducted will provide this. As well, the subprogram manager will be working with various groups such as the Tillage Club formed in Essex County. It is noted that the formation of such clubs is a very positive sign.

Information such as changes in soil quality, erosion potential and management factors under new or improved technologies which impact on agricultural productivity can answer the important question of what TED's impact has been. Changes in the erosion potential can be calculated using the farm variability study, here again by the employment of cesium 137 testing. A study has been done on soil compaction, particularly clay. It is hoped that additional material will come out of this in order to estimate changes in soil quality. The length of time of the program makes it difficult to see much change. There are a few sites seven years old that are being used. However it appears that a minimum of five years is required, maybe even ten.

By the end of SWEEP the Technology Evaluation and Development Subprogram will have evaluated new technologies, but it has not been specifically planned to come up with new technologies. Since SWEEP is one of the first major projects calling for research into conservation tillage in Southwestern Ontario TED is evaluating technology that currently exists. If the program had another five years then there would be better opportunity for new technologies to be developed, and as well for the expertise to be developed.

To determine if SWEEP has stimulated further research or developed expertise in soil and water conservation, the number of problems and worthy research proposals not addressed in soil and water conservation because of time or financial restraints is to

be recorded. There is already a file of unsolicited proposals. There are a great many ideas, but there are more high priority ones than can be addressed, and a lot that are not high priority. The private sector participation has been disappointing, so the IED manager has turned to the University of Guelph and government agencies. Some farmers have even put a contract together. It just happens to be that this was not an area in which the private sector was previously involved; therefore, the expertise is not available. If the program had a longer time commitment the private sector might have been more interested.

Subprogram Three - Pilot Demonstration Watersheds

This sub-program is a key component to the research and monitoring aspects of SWEEP. However, it is behind schedule. Ideally, this sub-program should have been operating before the others and supplying recent information to the trial plots (local demonstrations). It would have identified effective technologies and their costs. As it stands, 1988/89 will be the first year of operation.

No watersheds are in operation. Public meetings have been held in four watersheds as part of the final selection process. Initial farmer reaction has been positive, with attendance of around 20 at each meeting.

Concern has been expressed that this sub-program may not now yield the information required to adequately address the evaluation issues identified with it. However, there should still be four years of useful information generated from the watersheds. Concerns for the scientific validity of this data reflect the limitations of a fixed period initiative such as SWEEP, rather than on the integrity of the sub-program.

The data collection needs rated high priority are:

- 1) changes in the rates of soil erosion and nutrient losses from agricultural lands.
- 2) estimates of the delayed agronomic impacts of conservation systems which are not captured in current measurements.

Subprogram Four - Local Demonstrations

The Local Demonstrations Subprogram is on schedule and doing well. There are 33 Tillage-2000 sites and 130 side-by-side demonstration sites. One hundred and fifty SWEEP signs have been placed indicating the location of the sites. A more accurate benchmark identification system was used at 19 farms, and 500 slope positions were identified. It has been reported that the interest remained high in the farming and research communities.

The high priority data items to be collected from the Local Demonstration sub-program are:

- 1) capital and/or start-up cost of conservation practices by

- 2) changes in operating costs, gross revenues and net income per hectare by technology.
- 3) number of technologies tested and evaluated.
- 4) number of T-2000, side-by-side and OSCIA demonstrations.
- 5) number of farmers involved in local demonstrations, by watershed.
- 6) catalogue of promotional materials (e.g. number of brochures, media articles, exhibits, factsheets, meetings and farm tours).

Capital costs are available for each individual with a Tillage-2000 site and for a few of the side-by-side demonstrations. Some of the T-2000 sites also have the changes in operating costs, gross revenues and net income, per hectare, by technology. All of this financial information can be obtained from the Economics Branch of the Ontario Ministry of Agriculture and Food.

The annual T-2000 report gives a listing of what technologies are used at each site. For the purposes of conducting this review the information for the current year is not available. The T-2000 report from the previous year will have to be used.

The number of farmers involved in local demonstrations can be collected per watershed by the Soil Conservation Advisors. There have been several demonstrations held with more planned for the upcoming year.

It would be difficult this year to produce a catalogue of promotional materials that included numbers of brochures, media articles, exhibits, factsheets, meetings and farm tours. There is a T-2000 brochure and an exhibit, which was redone this year. The Soil Conservation Advisors can collect these numbers and possibly include them in their annual reports. The factsheets are the responsibility of OMAF's Advisory Services, so the necessary information can be obtained from there.

It should be possible, in future, to address all the evaluation issues for subprogram four. The only problem involved might be in getting a reporting mechanism in place. This item is further discussed later in this report.

Subprogram Five - Technical Assistance

Tremendous interest by farmers was reported regarding inquiries about the enhanced OSCEPAP II program, tillage equipment and the Land Stewardship program. Articles have been prepared for newsletters and co-operation with other agencies has been excellent. However, numbers are needed to verify these statements.

The high priority data items for the Technical Assistance subprogram is:

- 1) number of farm visits and farms assisted by soil conservation advisors.

The factsheets are not moving quickly through the system. This may affect farmer awareness of conservation practices as this reduces the amount of information a farmer can obtain for himself before contacting specialists in the field. This may ultimately affect the adoption of conservation practices, but the effectiveness of factsheets in information dispersement would need to be evaluated to assess this.

It was felt that the Soil Conservation Advisors should be able to collect the data needed to address the evaluation issues attached to the Technical Assistance Sub-program. As stated for subprogram four, a method to do so must be developed.

Subprogram Six - Soil Conservation Incentives

There has been a good response to OSCEPAP 11. At the end of the third quarter approximately 100% of the soil conservation portion had been allocated. Fortunately, there was money available from the environmental protection portion to continue funding erosion control grants, so the program was not curtailed due to budget restraints. This section has exceeded expectations.

Erosion control contractors and private industry representatives participated in various conservation field days. This indicates interest by groups other than farmers.

The high priority data items for the Soil Conservation Incentives subprogram are:

- 1) number and the value of grants awarded to the applicants.
- 2) ratio of grant to total cost by type of conservation activity under SCI.

Subprogram Seven - Administration, Monitoring and Public Information

The public information component of this subprogram is progressing well. A speaker's kit and speaker's bureau were prepared along with a media briefing kit and articles for OMAF News. Several other documents were written and distributed. The SWEEP exhibit received exposure while on display at several large events such as the Royal Winter Fair.

To answer many of the evaluation issues raised under this subprogram a farmer survey may be necessary in the final year. Most of the data needed are changes in farmer awareness, attitudes and activities over the base period, and expressed as percentages of farmers. Since the issues are rated high and medium-to-high in priority it is important that the issues concerned can be addressed with valid information.

The high priority data items for the Evaluation Committee are:

- 1) percent of farmers/members of target groups aware of SWEEP and each SWEEP subprogram.
- 2) percent of farmers receiving assistance/information for SWEEP (especially by subprogram/component).
- 3) importance of assistance in conservation decisions.
- 4) percent of farmers who would not have implemented conservation practices in absence of SWEEP.

The Evaluation Committee will make an effort to see that measures are being taken to collect the necessary data for each sub-program. For example, a baseline survey of farmer awareness of conservation technology was undertaken this year. The Committee's responsibilities for collection of data such as: the percent of farmers receiving assistance/information from SWEEP and the percent of farmers who would not have implemented conservation practices in absence of SWEEP, may be partially incorporated in the review. Also, the importance of assistance to the farmer in making decisions to use conservation measures can be covered in the review.

Environmental Monitoring and Modelling Committee

The Environmental Monitoring and Modelling Committee (EMMC) functions outside the SWEEP structure as it is part of the Canada-Ontario Agreement on Great Lakes Water Quality. It collects information from and provides analysis to SWEEP. No data has been collected to date, but an agricultural modelling approach to estimate phosphorus reduction to the Lake Erie basin has been drawn up. Since the purpose of SWEEP is to reduce phosphorus loadings in the Lake Erie basin by 200 tonnes from cropland it is important that the reduction be measured to see whether or not the goal is met. The EMMC will be estimating this reduction under the Canada-Ontario agreement, so SWEEP will rely on its analysis. The EMMC will not rely solely on the Pilot Demonstration Watersheds Subprogram in the selected procedure, but will consider other phosphorus data sources as well.

The high priority evaluation issues for the Environmental Monitoring and Modelling Committee are:

- 1) change in phosphorus runoff from SWEEP area.
- 2) change in soil runoff in SWEEP area.
- 3) changes in agronomic indicators attributed to SWEEP.

General Comments

The federal subprograms, have for the most part, been delayed to 1988/89. However, at that time everything should be in place and meeting the goals as documented in the implementation plans. It appears, though, that the federal components, being more of a research nature, should have been functioning before or at the same time as the provincial programs. The information generated may not be available in time to be of aid to the provincially delivered components of SWEEP. It will be useful for future progressions in conservation practices if the Conservation Resource Centre is in place as an instrument to provide the information to the public.

Quarterly Reports

The use of the Quarterly Reports for future evaluations was considered. For the purposes of an evaluation the Quarterly Reports give an outline of the subprogram proceedings but, in some cases, more detailed, in-depth information is required. As well, the financial aspects of SWEEP have to be evaluated using documents other than the Quarterly Reports. Some quarters will have nothing to report. This is due to the fact that much of the data are seasonal. The review will be on a yearly basis, not quarterly. Since many of the data that will be collected in the future are on a one-time only basis per year, use of the annual report may be more appropriate.

Data Reporting Mechanism

It was suggested that a form of some kind be drawn up to facilitate the Soil Conservation Advisors collection of data. It would seem reasonable for the users to review the type of information to be collected and mutually design a form or system that they feel would assist them. The evaluation committee will work to facilitate the development of a better reporting framework for the soil conservation advisors in the Technical Assistance sub-program.

Recommendations

1. The timing of the eventual start-up of the subprograms was unsynchronized. As things stand, the provincial sub-programs will have ended while the federal sub-programs may still have two operating years left. This may diminish the ability to effectively evaluate SWEEP. Thus efforts should be made to ensure that no further dispersion in the timing between sub-programs occurs.
2. The Conservation Resource Centre is, as yet, non-operational. However, it is of the opinion of SWEEP program staff that this centre will perform a function vital to the effectiveness of the program. As well, much private and public involvement went into the development of the idea of a centre. Therefore the committee recommends that the centre be established, as quickly as possible.
3. The Monitoring and Evaluation Committee is concerned that a fundamental evaluation issue, namely "has phosphorus runoff been reduced by 200t/year by 1990?", may not be properly addressed. This is due to problems such as delays in the start up in subprograms and the changes to subprograms that these delays have necessitated. Therefore this committee encourages the collection of phosphorous runoff data with the TED and PDW subprograms and other programs.

APPENDIX 1: SWEEP EVALUATION FRAMEWORK

SWEEP EVALUATION FRAMEWORK

DATA COLLECTION NEEDS

AND RESPONSIBILITIES

DECEMBER 2, 1987

GUIDELINES

1. This SWEEP Evaluation Framework identifies that data needed from the SWEEP program for its evaluation. These data items were identified in the evaluation assessment conducted for SWEEP, and as such, are integral to the overall evaluation plan.
2. The data identified in the Framework will be collected in the winter of each year of the Program. This activity will constitute the basis for an Annual Review of SWEEP.
3. Sub-program managers are requested to ensure that those data items listed under their sub-programs are captured and compiled in their normal data collection activities, if possible. Managers should focus their efforts on collecting data items that relate to high priority issues for the Evaluation.
4. All data will be collected from the sub-programs by a SWEEP Evaluation Officer. This officer will be directed by and will report to the SWEEP Monitoring and Evaluation Committee. The above committee will be responsible for conducting the annual review of SWEEP.
5. Although the data collection will be on a sub-program basis, the annual reviews and the final evaluation will be on the SWEEP program as a whole. Therefore when collecting data, managers should keep in mind that the scope of the "Evaluation Issues Concerned" is the entire program.

SWEEP EVALUATION ISSUES

- | | | |
|-----|-----|---|
| L | 1. | Is there a need to reduce phosphorus runoff to Lake Erie? |
| M/H | 2. | Is a target of 200 t/yr by 1990 achievable? |
| L | 3. | Are changes in agricultural practices the best approach to decreasing non-point phosphorus runoff? |
| L | 4. | Is there a need to reduce soil erosion and degradation? |
| H | 5. | Has phosphorus runoff been reduced by 200 t/yr by 1990? |
| H | 6. | What has been the impact on agricultural productivity with respect to agronomics (yields, soil quality, erosion, and degradation)? |
| H | 7. | What has been the impact of conservation techniques on agricultural productivity in terms of farm income? |
| M/H | 8. | Has the program produced a useful and reliable information base? |
| M/H | 9. | Has awareness of soil and water quality issues changed? |
| M/H | 10. | Has the conservation ethic been promoted? Have attitudes towards conservation practices become more favorable? |
| H | 11. | To what extent can changes in awareness of soil and water quality issues and attitudes towards conservation practices be attributed to SWEEP? To what extent can changes in land management practices be attributed to SWEEP? |
| M | 12. | Has the program stimulated further research or developed expertise in soil and water conservation? |
| L | 13. | Has the program contributed to our understanding of the technology transfer process? |
| L | 14. | Has the program enhanced co-operation between implementing agencies? |
| M | 15. | Have agribusiness and other support industries been involved? |
| M | 16. | Has the introduction of conservation practices raised new farm management or environmental issues? |
| M | 17. | Have there been any other unintended impacts of the program? |
| M | 18. | Does the program complement/overlap/duplicate other efforts in soil and water conservation? |
| M | 19. | Is the organizational structure of SWEEP appropriate to the delivery of the program? |
| M/H | 20. | Are available resources commensurate with activities and objectives? |
| M | 21. | Is a five-year period long enough to achieve program (and sub-program) objectives? |
| M | 22. | Are there more cost-effective programs that would achieve the same objectives? |

LEGEND: Priority levels - H = High
L = Low

M = Medium
M/H = Medium to High

DATA RESPONSIBILITIES OF:

CONSERVATION RESOURCE CENTRE

Data To Be Collected

1. Description of biophysical and socioeconomic effects. (Identify sources for the above issue)
2. Qualitative description of effects of reducing loadings with respect to water supplies, recreation, fisheries, agriculture, etc. (Identify sources for the above issue)
3. Adequacy of CRC services and resources (incl. number of visits or enquiries, list of contacts, catalogues of SWEEP; reports; opinions)
4. Amount of funding from fee for service or memberships to CRC.
5. Number of requests for background research and trend over program life.
6. Catalogue of other effects and description of objectives and activities of other initiatives.

Evaluation Issues Concerned

What effects do high phosphorus loadings have? (E#1)

What are the benefits of reducing phosphorus loading? (E#1)

Is information readily available? (E#8)

Has the perceived importance of soil and water quality issues changed? (E#9)

To what extent has research activity increased? (E#12)

What other program or initiatives deal with soil and water conservation issues? (E#18)

DATA RESPONSIBILITIES OF:

SOCIOECONOMIC EVALUATION
COMPONENT

<u>Data To Be Collected</u>	<u>Evaluation Issues Concerned</u>
1. Description of socioeconomic effects.	What effects do high phosphorus loading have? (E#1)
2. Changes in economic indicators attributable to SWEEP (i.e. theoretical models).	What changes in economic productivity are attributable to SWEEP? (E#7)
3. Number of research projects funded under SEE component.	What information has been documented? (E#8)
4. Percent of farmers aware of soil & water quality issues.	To what extent has the information base contributed to adoption of conservation practices or attitudes towards these practices? (E#8)
5. Changes in or development of new practices based on SWEEP activities.	To what extent would conservation practices have been adopted in the absence of SWEEP? (E#11)
6. Numbers and values of new university research projects.	To what extent has research activity increased? (E#11)
7. Number of projects funded under SEE specifically addressing technology transfer issues.	Is there new & useful information on the technology transfer process? (E#13)

DATA RESPONSIBILITIES OF:

TECHNOLOGY EVALUATION & DEVELOPMENT SUB-PROGRAM

<u>Data To Be Collected</u>	<u>Evaluation Issues Concerned</u>
1. Per hectare reduction in phosphorus runoff from est plots of new technologies.	Has phosphorus runoff been reduced by 200 t/yr by 1990? (E#5)
2. Opinions on rate of adoption of best available technology and new technology.	Is a target of 200 t/yr by 1990 achievable? (E#2)
3. Changes in soil quality, erosion potential and management factors under new or improved technologies which impact on agricultural productivity.	What has been the impact of TED on agricultural productivity with respect to agronomics (yields, soil quality, erosion and degradation)? (E#6)
4. Number of new technologies or technological improvements to existing technologies tested and evaluated by TED.	Has the program produced a useful and reliable information base? (E#8)
5. Number of problems and worthy research proposals not addressed in soil and water conservation because of time or financial restraints.	Has the problem stimulated further research or developed expertise in soil and water conservation? (E#12)

DATA RESPONSIBILITIES OF:
FARM LEVEL ECONOMIC ANALYSIS
COMPONENT

<u>Data To Be Collected</u>	<u>Evaluation Issues Concerned</u>
1. Changes in farm costs (e.g. pesticide losses) under different technologies.	Has soil degradation affected agricultural productivity? (E#6)
2. Capital and/or start-up cost of conservation practices by technology.	Have conservation practices resulted in increased revenue and/or costs? (E#7)
3. Change in operation costs, gross revenue & net income per hectare by technology.	Same as above.
4. Change in macroeconomic indicators in SWEEP area. (such as FCR, total output and farm net income)	Same as above.
5. Percent of all farmers receiving assistance/information from SWEEP (specified by sub-program/component).	Same as above.

DATA RESPONSIBILITIES OF:

PILOT DEMONSTRATION WATERSHED
SUB-PROGRAM

Data To Be Collected

Evaluation Issues Concerned

- | | |
|---|---|
| 1. Per hectare reduction in phosphorus runoff in pilot demonstration watersheds. | Can phosphorus runoff be reduced by 200 t/yr by implementation of best available conservation technology? (E#2) |
| 2. Initial estimate of phosphorous runoff from study watersheds. | Is agricultural phosphorus runoff a large proportion of runoff? (E#3) |
| 3. Change in rates of soil erosion, nutrient losses. | Has soil quality deteriorated? (E#6) |
| 4. Changes in agricultural productivity/profitability in the chosen watersheds. | Has soil degradation affected agricultural productivity? (E#4) |
| 5. Changes in soil degradation. | Same as above. |
| 6. Analysis of changes in attitudes in demonstration watersheds. | Is there greater acceptance of conservation practices? (E#10) |
| 7. Opinions on degree to which current measurements capture impacts of conservation measures. | Are there delayed agronomic impacts of conservation practices which are not captured in current measurements; if so, how significant are they likely to be? (E#6) |
| 8. Examples of development of new products or practices by agri-business. | To what extent has research activity increased? (E#12) |
| 9. Opinions on importance of new environmental issues. | What new environmental issues have been raised (e.g., changes in fertilizer, pesticide use, toxic chemical buildup, etc.)? (E#16) |

Continued...../7

DATA RESPONSIBILITIES OF:

PILOT DEMONSTRATION WATERSHED
SUB-PROGRAM CONTINUED

Data To Be Collected

10. Opinions on future impact
of information base.

Evaluation Issues Concerned

Were evaluation of
conservation practices
available soon enough to be
fully incorporated into
extention services? (E#21)

DATA RESPONSIBILITIES OF:

TECHNICAL ASSISTANCE
SUB-PROGRAM

<u>Data To Be Collected</u>	<u>Evaluation Issues Concerned</u>
1. Number of farm visits & farms assisted by soil conservation advisors.	Is the public aware of SWEEP?
2. Awareness of SWEEP & SWEEP Sub-program/components by industry.	Have support industries participated in SWEEP? (E#15)
3. Number of members of support industries attending SWEEP activities.	Same as above.
4. Degree to which industry has responded to changing needs such as inputs, services, etc.	Same as above.
5. Number of new methods/practices developed and introduced.	Did support industries increase their interests & involvement in conservation practices? (E#15)
6. Number of news releases, pamphlets, etc. developed and delivered to the public.	Is information readily available? (E#8)

DATA RESPONSIBILITIES OF:

LOCAL DEMONSTRATION
SUB-PROGRAM

Data To Be Collected

Evaluation Issues Concerned

- | | |
|--|--|
| 1. Capital and/or start-up cost of conservation practices by technology (OMAF-Eco. Br.) | Have conservation practices resulted in increased revenue and/or cost? (E#7) |
| 2. Changes in operating costs, gross revenues & net income per hectare by technology. | Same as above. |
| 3. Number of technologies tested. | What information has been documented? (E#7) |
| 4. Number of 1-2000, side-by-side- & OSCIA demonstrations. | Is the public aware of SWEEP? (E#11) |
| 5. Number of farmers involved in local demonstration, by watershed. | Same as above. |
| 6. Catalogue of promotional materials (e.g. number of brochures, media articles, exhibits, fact sheets, meetings and farm tours) | Same as above. |

DATA RESPONSIBILITIES OF:

SOIL CONSERVATION
INCENTIVES SUB-PROGRAM

<u>Data To Be Collected</u>	<u>Evaluation Issues Concerned</u>
1. Number and the value of grants awarded to the applicants.	Is the public aware of SWEEP? (E#11)
2. Opinions on this question.	Are farmers more knowledgeable about conservation practices? (E#10)
3. Ratio of grant to total cost by type of conservation activity under SCI.	To what extent would conservation practices have been adopted in the absence of SWEEP? (E#11)
4. Opinions on this question.	Is there greater acceptance of conservation practices? (E#10)

DATA RESPONSIBILITIES OF:
MONITORING AND EVALUATION
COMMITTEE

Data To Be Collected	Evaluation Issues Concerned
1. Percent of farmers aware of soil and water quality issues.	Has awareness of soil quality and water quality issues increased? (E#9)
2. Percent of farmers familiar with conservation practices.	Are farmers knowledgeable about conservation practices? (E#10)
3. Percent of farmers who consider conservation practices in farm management decisions.	Same as above.
4. Percent of farmers/members of target groups aware of SWEEP & each SWEEP sub-program.	Is the public aware of SWEEP? (E#11)
5. Percent of farmers receiving assistance/information from SWEEP (especially by sub-program/component).	To what extent would conservation practices have been adopted in the absence of SWEEP? (E#11)
6. Importance of assistance in conservation decisions	Same as above.
7. Percent of farmers who would not have implemented conservation practices in absence of SWEEP.	Same as above.

**DATA RESPONSIBILITIES OF:
MANAGEMENT COMMITTEE**

<u>Data To Be Collected</u>	<u>Evaluation Issues Concerned</u>
1. Opinions on importance of CRC information and SEE research results in developing conservation programs and policies.	To what extent has the information base contributed to adoption of conservation practices or attitudes towards these practices? (E#8)
2. Number and nature of new research projects.	To what extent has research activity increased? (E#12)
3. Opinions on this question.	To what extent has private sector capability in soil & water conservation issues changed? (E#12)
4. Opinions on usefulness of SEE research. (examples of results being introduced into conservation programs, policies, & extension services).	Is there new & useful information on the technology transfer process? (E#13)
5. Number & nature of new initiatives.	Have any new cooperative efforts been initiated? (E#14)
6. Opinions on the effectiveness of separating federal and provincial responsibilities.	Was the organizational structure appropriate? (E#19)
7. Opinions on appropriateness of contracting out federal components (with respect to cost effectiveness, quality of work, coordination of SWEEP activities, development of private sector expertise)	Same as above.

Continued...../13

DATA RESPONSIBILITIES OF:

MANAGEMENT COMMITTEE CONTINUED

Data To Be Collected

Evaluation Issues Concerned

- | | |
|---|---|
| 8. Delays caused by the administration & review process (including reviews by IAP, contract approvals by DSS) | Did the program structure optimize the flow of information to various staff, target groups, & the farm community? (E#19) |
| 9. Opinions on this question. | Were activities curtailed due to budget constraints? (E#20) |
| 10. Opinions on this question. | Was there an appropriate allocation of funds between the research and development components of the program? (E#22) |
| 11. Opinions on this question. | What changes to program structure are needed? (E#22) |
| 12. Opinions on this question. | What changes to program activities are needed? (E#22) |
| 13. Opinions on availability, use & importance of information from federal components to extension workers. | Did the program structure optimize the flow of information to various staff, target groups, and the farming community? (E#19) |
| 14. Expenditures as percent of budgets by component. | Did the sub-program operate within budgets? Below budgets? (E#19) |
| 15. Number and value of request for additional funding. | Were activities curtailed due to budget constraints? (E#19) |

DATA RESPONSIBILITIES OF:

**ENVIRONMENTAL MONITORING AND
MODELLING COMMITTEE OF THE
CANADA/ONTARIO AGREEMENT**

<u>Data To Be Collected</u>	<u>Evaluation Issues Concerned</u>
1. Change in phosphorus runoff from SWEEP area.	How have changes in land management practices affected phosphorus runoff from the SWEEP area? (E#5)
2. Change in soil runoff in SWEEP area.	Have conservation practices reduced soil runoff and if so, how? (E#6)
3. Change in soil quality in SWEEP area.	Have conservation practices affected soil quality and if so, how? (E#6)
4. Changes in agronomic indicators attributed to SWEEP.	What changes in agronomics can be due to SWEEP? (E#6)
5. Change in economic indicators in SWEEP area.	Have conservation practices resulted in increased revenue and/or costs? (E#7)
6. Per hectare reduction in phosphorus runoff from test plots of new technologies.	Has phosphorus runoff been reduced by 200 tonnes/year? (E#5)